



SEQUENCE LISTING

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<120> GFR-alpha-1-RET Specific Agonists and Methods Therefor

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<140>
<141>

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<170> PatentIn Ver. 2.0

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<212> PRT
<213> Homo sapiens

<400> 1

Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala Glu Leu Gly Leu Gly
1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
20 25 30

Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala Leu Ala Arg Leu Gln
35 40 45

Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys Arg Pro Thr Arg Tyr
50 55 60

Thr Asp Val Ala Phe Leu Asp Asp Arg His Arg Trp Gln Arg Leu Pro
65 70 75 80

Gln Leu Ser Ala Ala Cys Gly Cys
85

<210> 2
<211> 89
<212> PRT
<213> Mouse

<400> 2

Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu Gly Leu Gly
1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
20 25 30

Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala Arg Leu Arg
35 40 45

Gly Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro Thr Ser Tyr
50 55 60

Ala Asp Val Thr Phe Leu Asp Asp Gln His His Trp Gln Gln Leu Pro
65 70 75 80

Gln Leu Ser Ala Ala Ala Cys Gly Cys
85

<210> 3
<211> 89
<212> PRT
<213> RAT

<400> 3
Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu Gly Leu Gly
1 5 10 15

Tyr Ala Ser Glu Glu Lys Ile Ile Phe Arg Tyr Cys Ala Gly Ser Cys
20 25 30

Pro Gln Glu Val Arg Thr Gln His Ser Leu Val Leu Ala Arg Leu Arg
35 40 45

Gly Gln Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro Thr Ser Tyr
50 55 60

Ala Asp Val Thr Phe Leu Asp Asp His His His Trp Gln Gln Leu Pro
65 70 75 80

Gln Leu Ser Ala Ala Ala Cys Gly Cys
85

<210> 4
<211> 93
<212> PRT
<213> Homo sapiens

<400> 4
Cys Val Leu Thr Ala Ile His Leu Asn Val Thr Asp Leu Gly Leu Gly
1 5 10 15

Tyr Glu Thr Lys Glu Glu Leu Ile Phe Arg Tyr Cys Ser Gly Ser Cys
20 25 30

Asp Ala Ala Glu Thr Thr Tyr Asp Lys Ile Leu Lys Asn Leu Ser Arg
35 40 45

Asn Arg Arg Leu Val Ser Asp Lys Val Gly Gln Ala Cys Cys Arg Pro
50 55 60

Ile Ala Phe Asp Asp Asp Leu Ser Phe Leu Asp Asp Asn Leu Val Tyr
65 70 75 80

His Ile Leu Arg Lys His Ser Ala Lys Arg Cys Gly Cys
85 90

<210> 5
<211> 93
<212> PRT
<213> Mouse

<400> 5

Cys Val Leu Thr Ala Ile His Leu Asn Val Thr Asp Leu Gly Leu Gly
 1 5 10 15

Tyr Glu Thr Lys Glu Glu Leu Ile Phe Arg Tyr Cys Ser Gly Ser Cys
 20 25 30

Glu Ser Ala Glu Thr Met Tyr Asp Lys Ile Leu Lys Asn Leu Ser Arg
 35 40 45

Ser Arg Arg Leu Thr Ser Asp Lys Val Gly Gln Ala Cys Cys Arg Pro
 50 55 60

Val Ala Phe Asp Asp Asp Leu Ser Phe Leu Asp Asp Asn Leu Val Tyr
 65 70 75 80

His Ile Leu Arg Lys His Ser Ala Lys Arg Cys Gly Cys
 85 90

<210> 6

<211> 93

<212> PRT

<213> RAT

<400> 6

Cys Val Leu Thr Ala Ile His Leu Asn Val Thr Asp Leu Gly Leu Gly
 1 5 10 15

Tyr Glu Thr Lys Glu Glu Leu Ile Phe Arg Tyr Cys Ser Gly Ser Cys
 20 25 30

Glu Ala Ala Glu Thr Met Tyr Asp Lys Ile Leu Lys Asn Leu Ser Arg
 35 40 45

Ser Arg Arg Leu Thr Ser Asp Lys Val Gly Gln Ala Cys Cys Arg Pro
 50 55 60

Val Ala Phe Asp Asp Asp Leu Ser Phe Leu Asp Asp Ser Leu Val Tyr
 65 70 75 80

His Ile Leu Arg Lys His Ser Ala Lys Arg Cys Gly Cys
 85 90

<210> 7

<211> 94

<212> PRT

<213> Homo sapiens

<400> 7

Cys Gly Leu Arg Glu Leu Glu Val Arg Val Ser Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Ala Ser Asp Glu Thr Val Leu Phe Arg Tyr Cys Ala Gly Ala Cys
 20 25 30

Glu Ala Ala Ala Arg Val Tyr Asp Leu Gly Leu Arg Arg Leu Arg Gln
 35 40 45

Arg Arg Arg Leu Arg Arg Glu Arg Val Arg Ala Gln Pro Cys Cys Arg
 50 55 60

Pro Thr Ala Tyr Glu Asp Glu Val Ser Phe Leu Asp Ala His Ser Arg
 65 70 75 80

Tyr His Thr Val His Glu Leu Ser Ala Arg Glu Cys Ala Cys
 85 90

<210> 8
 <211> 94
 <212> PRT
 <213> Mouse

<400> 8
 Cys Gly Leu Arg Glu Leu Glu Val Arg Val Ser Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Thr Ser Asp Glu Thr Val Leu Phe Arg Tyr Cys Ala Gly Ala Cys
 20 25 30

Glu Ala Ala Ile Arg Ile Tyr Asp Leu Gly Leu Arg Arg Leu Arg Gln
 35 40 45

Arg Arg Arg Val Arg Arg Glu Arg Ala Arg Ala His Pro Cys Cys Arg
 50 55 60

Pro Thr Ala Tyr Glu Asp Glu Val Ser Phe Leu Asp Val His Ser Arg
 65 70 75 80

Tyr His Thr Leu Gln Glu Leu Ser Ala Arg Glu Cys Ala Cys
 85 90

<210> 9
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 <213> Homo sapiens

<400> 9
 Cys Arg Leu Arg Ser Gln Leu Val Pro Val Arg Ala Leu Gly Leu Gly
 1 5 10 15

His Arg Ser Asp Glu Leu Val Arg Phe Arg Phe Cys Ser Gly Ser Cys
 20 25 30

Arg Arg Ala Arg Ser Pro His Asp Leu Ser Leu Ala Ser Leu Leu Gly
 35 40 45

Ala Gly Ala Leu Arg Pro Pro Pro Gly Ser Arg Pro Val Ser Gln Pro
 50 55 60

Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn
 65 70 75 80

Ser Thr Trp Arg Thr Val Asp Arg Leu Ser Ala Thr Ala Cys Gly Cys
 85 90 95

<210> 10
 <211> 96
 <212> PRT
 <213> Mouse

<400> 10
 Cys Arg Leu Arg Ser Gln Leu Val Pro Val Ser Ala Leu Gly Leu Gly
 1 5 10 15
 His Ser Ser Asp Glu Leu Ile Arg Phe Arg Phe Cys Ser Gly Ser Cys
 20 25 30
 Arg Arg Ala Arg Ser Gln His Asp Leu Ser Leu Ala Ser Leu Leu Gly
 35 40 45
 Ala Gly Ala Leu Arg Ser Pro Pro Gly Ser Arg Pro Ile Ser Gln Pro
 50 55 60
 Cys Cys Arg Pro Thr Arg Tyr Glu Ala Val Ser Phe Met Asp Val Asn
 65 70 75 80
 Ser Thr Trp Arg Thr Val Asp His Leu Ser Ala Thr Ala Cys Gly Cys
 85 90 95

<210> 11
 <211> 109
 <212> PRT
 <213> MURINE

<400> 11
 Ala Leu Ala His His His His His Asp Tyr Lys Asp Asp Asp Asp
 1 5 10 15
 Lys Gly Ser Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu
 20 25 30
 Gly Leu Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala
 35 40 45
 Gly Ser Cys Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala
 50 55 60
 Arg Leu Arg Gly Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro
 65 70 75 80
 Thr Ala Phe Asp Asp Asp Val Thr Phe Leu Asp Asp Gln His His Tyr
 85 90 95
 His Ile Leu Arg Lys His Ser Ala Ala Ala Cys Gly Cys
 100 105

<210> 12
 <211> 90
 <212> PRT
 <213> MURINE

<400> 12
 Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
 20 25 30

Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala Arg Leu Arg
 35 40 45

Gly Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro Thr Ala Phe
 50 55 60

Asp Asp Asp Val Thr Phe Leu Asp Asp Gln His His Tyr His Ile Leu
 65 70 75 80

Arg Lys His Ser Ala Ala Cys Gly Cys
 85 90

<210> 13

<211> 109

<212> PRT

<213> Mouse

<400> 13

Ala Leu Ala His His His His His Asp Tyr Lys Asp Asp Asp Asp
 1 5 10 15

Lys Gly Ser Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu
 20 25 30

Gly Leu Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala
 35 40 45

Gly Ser Cys Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala
 50 55 60

Arg Leu Arg Gly Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro
 65 70 75 80

Thr Ala Tyr Glu Asp Glu Val Thr Phe Leu Asp Asp Gln His His Tyr
 85 90 95

His Thr Leu Gln Glu Leu Ser Ala Ala Cys Gly Cys
 100 105

<210> 14

<211> 90

<212> PRT

<213> Mouse

<400> 14

Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
 20 25 30

Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala Arg Leu Arg

35

40

45

Gly Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro Thr Ala Tyr
 50 55 60

Glu Asp Glu Val Thr Phe Leu Asp Asp Gln His His Tyr His Thr Leu
 65 70 75 80

Gln Glu Leu Ser Ala Ala Ala Cys Gly Cys
 85 90

<210> 15

<211> 108

<212> PRT

<213> Mouse

<400> 15

Ala Leu Ala His His His His His Asp Tyr Lys Asp Asp Asp Asp
 1 5 10 15

Lys Gly Ser Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu
 20 25 30

Gly Leu Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala
 35 40 45

Gly Ser Cys Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala
 50 55 60

Arg Leu Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro
 65 70 75 80

Thr Arg Tyr Glu Ala Val Thr Phe Leu Asp Asp Gln His His Trp Arg
 85 90 95

Thr Val Asp His Leu Ser Ala Ala Cys Gly Cys
 100 105

<210> 16

<211> 89

<212> PRT

<213> Mouse

<400> 16

Cys Arg Leu Trp Ser Leu Thr Leu Pro Val Ala Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
 20 25 30

Pro Gln Glu Ala Arg Thr Gln His Ser Leu Val Leu Ala Arg Leu Arg
 35 40 45

Gly Arg Gly Arg Ala His Gly Arg Pro Cys Cys Gln Pro Thr Arg Tyr
 50 55 60

Glu Ala Val Thr Phe Leu Asp Asp Gln His His Trp Arg Thr Val Asp
 65 70 75 80

His Leu Ser Ala Ala Ala Cys Gly Cys
85

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<400> 17
Ala Phe Asp Asp Asp
1 5

<210> 18
<211> 5
<212> PRT
<213> Homo sapiens

<400> 18
Ala Tyr Glu Asp Glu
1 5

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<400> 19
Arg Tyr Glu Ala
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<212> PRT
<213> Homo sapiens

<400> 20
Tyr His Ile Leu Arg Lys His
1 5

<210> 21
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<212> PRT
<213> Homo sapiens

<400> 21
Tyr His Thr Val His Glu Leu
1 5

<210> 22
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<213> Homo sapiens

<400> 22
Trp Arg Thr Val Asp Arg Leu

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 <213> Homo sapiens

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 Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
 20 25 30

Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala Leu Ala Arg Leu Gln
 35 40 45

Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys Arg Pro Thr Ala Phe
 50 55 60

Asp Asp Asp Val Ala Phe Leu Asp Asp Arg His Arg Tyr His Ile Leu
 65 70 75 80

Arg Lys His Ser Ala Ala Ala Cys Gly Cys
 85 90

<210> 24
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<400> 24
 Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
 20 25 30

Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala Leu Ala Arg Leu Gln
 35 40 45

Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys Arg Pro Thr Ala Tyr
 50 55 60

Glu Asp Glu Val Ala Phe Leu Asp Asp Arg His Arg Tyr His Thr Val
 65 70 75 80

His Glu Leu Ser Ala Ala Ala Cys Gly Cys
 85 90

<210> 25
 <211> 89
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 <213> Homo sapiens

<400> 25
 Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala Glu Leu Gly Leu Gly
 1 5 10 15

Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr Cys Ala Gly Ser Cys
 20 25 30

Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala Leu Ala Arg Leu Gln
 35 40 45

Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys Arg Pro Thr Arg Tyr
 50 55 60

Glu Ala Val Ala Phe Leu Asp Asp Arg His Arg Trp Arg Thr Val Asp
 65 70 75 80

Arg Leu Ser Ala Ala Cys Gly Cys
 85

<210> 26

<211> 97

<212> PRT

<213> Homo sapiens

<400> 26

Ala Leu Ser Gly Pro Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala
 1 5 10 15

Glu Leu Gly Leu Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr
 20 25 30

Cys Ala Gly Ser Cys Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala
 35 40 45

Leu Ala Arg Leu Gln Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys
 50 55 60

Arg Pro Thr Ala Phe Asp Asp Asp Val Ala Phe Leu Asp Asp Arg His
 65 70 75 80

Arg Tyr His Ile Leu Arg Lys His Ser Ala Ala Cys Gly Cys Gly
 85 90 95

Gly

<210> 27

<211> 97

<212> PRT

<213> Homo sapiens

<400> 27

Ala Leu Ser Gly Pro Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala
 1 5 10 15

Glu Leu Gly Leu Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr
 20 25 30

Cys Ala Gly Ser Cys Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala
 35 40 45

Leu Ala Arg Leu Gln Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys

50

55

60

Arg Pro Thr Ala Tyr Glu Asp Glu Val Ala Phe Leu Asp Asp Arg His
 65 70 75 80

Arg Tyr His Thr Val His Glu Leu Ser Ala Ala Ala Cys Gly Cys Gly
 85 90 95

Gly

<210> 28

<211> 96

<212> PRT

<213> Homo sapiens

<400> 28

Ala Leu Ser Gly Pro Cys Gln Leu Trp Ser Leu Thr Leu Ser Val Ala
 1 5 10 15

Glu Leu Gly Leu Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe Arg Tyr
 20 25 30

Cys Ala Gly Ser Cys Pro Arg Gly Ala Arg Thr Gln His Gly Leu Ala
 35 40 45

Leu Ala Arg Leu Gln Gly Gln Gly Arg Ala His Gly Gly Pro Cys Cys
 50 55 60

Arg Pro Thr Arg Tyr Glu Ala Val Ala Phe Leu Asp Asp Arg His Arg
 65 70 75 80

Trp Arg Thr Val Asp Arg Leu Ser Ala Ala Cys Gly Cys Gly Gly
 85 90 95

<210> 29

<211> 151

<212> PRT

<213> Homo sapiens

<400> 29

Arg Leu Lys Arg Ser Pro Asp His His His His His Asp Tyr Lys
 5 10 15

Asp Asp Asp Asp Lys Gln Ala Ala Leu Pro Arg Arg Glu Arg Asn
 20 25 30

Arg Gln Ala Ala Ala Ser Pro Glu Asn Ser Arg Gly Lys Gly Arg
 35 40 45

Arg Gly Gln Arg Gly Lys Asn Arg Gly Cys Val Leu Thr Ala Ile His
 50 55 60

Leu Asn Val Thr Asp Leu Gly Leu Gly Tyr Glu Thr Lys Glu Glu Leu
 65 70 75 80

Ile Phe Arg Tyr Cys Ser Gly Ser Cys Glu Ala Ala Glu Thr Met Tyr
 85 90 95

Asp Lys Ile Leu Lys Asn Leu Ser Arg Ser Arg Arg Leu Thr Ser Asp
 100 105 110

Lys Glu Gly Gln Ala Cys Cys Arg Pro Val Ala Phe Asp Asp Asp Leu
 115 120 125

Ser Phe Leu Asp Asp Ser Leu Val Tyr His Ile Leu Arg Lys His Ser
 130 135 140

Ala Lys Arg Cys Gly Cys Ile
 145 150

<210> 30

<211> 114

<212> PRT

<213> Homo sapiens

<400> 30

Arg Leu Pro Arg Ala Leu Ala His His His His His His Asp Tyr Lys
 5 10 15

Asp Asp Asp Asp Lys Gly Ser Cys Arg Leu Trp Ser Leu Thr Leu Pro
 20 25 30

Val Ala Glu Leu Gly Leu Gly Tyr Ala Ser Glu Glu Lys Val Ile Phe
 35 40 45

Arg Tyr Cys Ala Gly Ser Cys Pro Gln Glu Ala Arg Thr Gln His Ser
 50 55 60

Leu Val Leu Ala Arg Leu Arg Gly Arg Gly Arg Ala His Gly Arg Pro
 65 70 75 80

Cys Cys Gln Pro Thr Ser Tyr Ala Asp Val Thr Phe Leu Asp Asp Gln
 85 90 95

His His Trp Gln Gln Leu Pro Gln Leu Ser Ala Ala Ala Cys Gly Cys
 100 105 110

Gly Gly

<210> 31

<211> 118

<212> PRT

<213> Homo sapiens

<400> 31

Arg Ala Arg Arg Pro Gly Ala His His His His His Asp Tyr Lys
 5 10 15

Asp Asp Asp Asp Lys Arg Gly Cys Val Leu Thr Ala Ile His Leu Asn
 20 25 30

Val Thr Asp Leu Gly Leu Gly Tyr Glu Thr Lys Glu Glu Leu Ile Phe
 35 40 45

Arg Tyr Cys Ser Gly Ser Cys Glu Ala Ala Glu Thr Met Tyr Asp Lys
 50 55 60

Ile Leu Lys Asn Leu Ser Arg Ser Arg Arg Leu Thr Ser Asp Lys Val
65 70 75 80

Gly Gln Ala Cys Cys Arg Pro Val Ala Phe Asp Asp Asp Asp Leu Ser
85 90 95

Phe Leu Asp Asp Ser Leu Val Tyr His Ile Leu Arg Lys His Ser Ala
100 105 110

Lys Arg Cys Gly Cys Ile
115

<210> 32

<211> 25

<212> PRT

<213> Homo sapiens

<400> 32

Arg Arg Ala Arg Pro Gly Ala His His His His His Asp Tyr Lys
5 10 15

Asp Asp Asp Asp Lys Arg Gly Cys Arg
20 25